wherein said encoding step encodes the order relating to the perspective depth.

12. (Not Amended From Previous Version) The method according to claim 11, further comprising the steps of:

decoding a code encoded in said encoding step;

generating a local pattern from a code word contained in code data decoded in said decoding step; and

combining a plurality of local patterns, which have been generated in said quantizing step, based upon position coordinates of a singularity decoded in said decoding step, and order information relating to perspective depth of a plurality of representative vectors.

REMARKS

Claims 1 to 12 are pending in the application, with Claims 1 and 8 being the independent claims herein. Reconsideration and further examination are respectfully requested.

Claims 1 to 12 were rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 5,905,579 (Katayama). Reconsideration and withdrawal of this rejection are respectfully requested.

In general, the invention is characterized by the features of(1) replacing each local pattern with regard to each depth in a discrete multi-resolution representation of the input image with a code word, and (2) encoding data, which includes a coordinate of a

singularity detected in the input image and which includes the code word, by using an algebraic coding.

Turning to specific claim language, independent Claim1 is directed to an image processing apparatus which includes transformation means for transforming data space of an input image to discrete multi-resolution space and outputting a discrete multi-resolution representation of the input image, detecting means for detecting a singularity in the input image, extracting means for extracting a local pattern in the neighborhood of each coordinate of the discrete multi-resolution representation of the input image, with regard to each of a plurality of depths, quantizing means for creating a quantization code book based upon the extracted local pattern and replacing each local pattern of respective depths of the discrete multi-resolution representation by a code word using the code book, and encoding means for algebraic encoding data which includes position coordinates of the singularity in the input image and the code word provided by the quantizing means.

The applied art, namely Katayama, is not seen to disclose or suggest at least the foregoing features of replacing each local pattern of respective depths of the discrete multi-resolution representation by a code word using a code book, and algebraic encoding data which includes position coordinates of a singularity in the input image and a code word provided by quantizing means.

Katayama is seen to teach that input image data 500 is converted into ten frequency bands of image data 503-512 by using a wavelet transformation, absolute pixel values of three frequency bands of the image data 504-506 are added and normalized (Katayama, col. 4, lines 24-62), and binary image data indicating an edge pixel as `1' is

outputted by a binarization process using a threshold value for binarizing the added and normalized pixel value (Katayama, col. 5, lines 9-27). Katayama is then seen to determine whether an interest area is a character area or not, based on the number of edge pixels in a block divided from the binary image data (Katayama, col. 5, lines 38-50).

Further, Katayama is seen to teach that color character data in input image data is detected, the detected color-character data is converted into binary-series data, and the binary-series data is encoded using a dynamic arithmetic coding, but that the input image data removed the color-character data is encoded using a discrete cosine transformation (DCT) (Katayama, col. 9, lines 1-43). In other words, Katayama is seen to teach determining a kind of image area based on the number of edge pixels, and that plural frequency bands of image data are only used for detection of an edge, and that data subjected to coding are a color-character data and input image data removed from the color-character data.

However, as mentioned above, nowhere is Katayama seen to teach or suggest replacement of each local pattern with regard to each depth in a discrete multi-resolution representation of the input image with a code word, as in the present invention of independent Claim 1. In addition, Katayama is not seen to disclose or suggest algebraically encoding a coordinate of the singularity in the input image, along with the code word, as in the present invention of independent Claim 1.

It is alleged in the Office Action that Katayama teaches creating a quantization code book as in independent Claim 1 because Katayama is seen to create a look-up table (LUT) based on extracted points. Applicant strongly disagrees with this assertion. In particular, each of LUTs (143 to 151) referred to in the Office Action are

simply used to deliver a "1" value for each edge point detected in the 3x3 pixels that the LUT represents. (Katayama, col. 5, lines 61 to 67; and col. 6, lines 1 to 3). LUTs 143 to 151 of Katayama are not seen to replace each local pattern with regard to each depth in a discrete multi-resolution representation of the input image with a code word, but are instead simply seen to represent each edge point with a "1" value. Nowhere is Katayama seen to replace a local pattern with a single code word, much less with regard to each depth in a discrete multi-resolution representation of the input image.

It is further alleged in the Office Action that expansion/contraction circuit 5 of Katayama teaches the algebraic encoding of a coordinate of the singularity in the input image, along with the code word. Applicant also strongly disagrees with this assertion. Specifically, expansion/contraction circuit 5 of Katayama is seen to simply examine the surrounding pixels of a pixel of interest and then to change the pixel of interest to either white or black depending on the shade of the surrounding pixels. (Katayama, col. 6, lines 47 to 67; and col. 7, lines 1 to 8). Nowhere is Katayama seen to disclose that algebraic encoding is performed on data which includes position coordinates of a singularity in the input image and which includes a code word provided by the quantizing means. Instead, expansion/contraction circuit 5 of Katayama is only seen to modify the binary value of a pixel of interest based on the value of surrounding pixels, but is not seen to be concerned in any way with position coordinates of a singularity in the input image, much less with the encoding of such position coordinates.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP § 2131, citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2

USPQ 2d 1051, 1053 (Fed. Cir. 1987). MPEP § 2131. In the present case, Applicant submits that Katayama does not anticipate the present invention of independent Claim 1 because Katayama is not seen to teach or suggest each element of independent Claim 1.

Based on the foregoing remarks, independent Claim1 is believed to be in condition for allowance, and such action is respectfully requested. In addition, independent Claim 8 is directed to a method for image processing substantially corresponding to the features of independent Claim1, and is therefore believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 1.

The other pending claims in this application are each dependent from the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, CA office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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